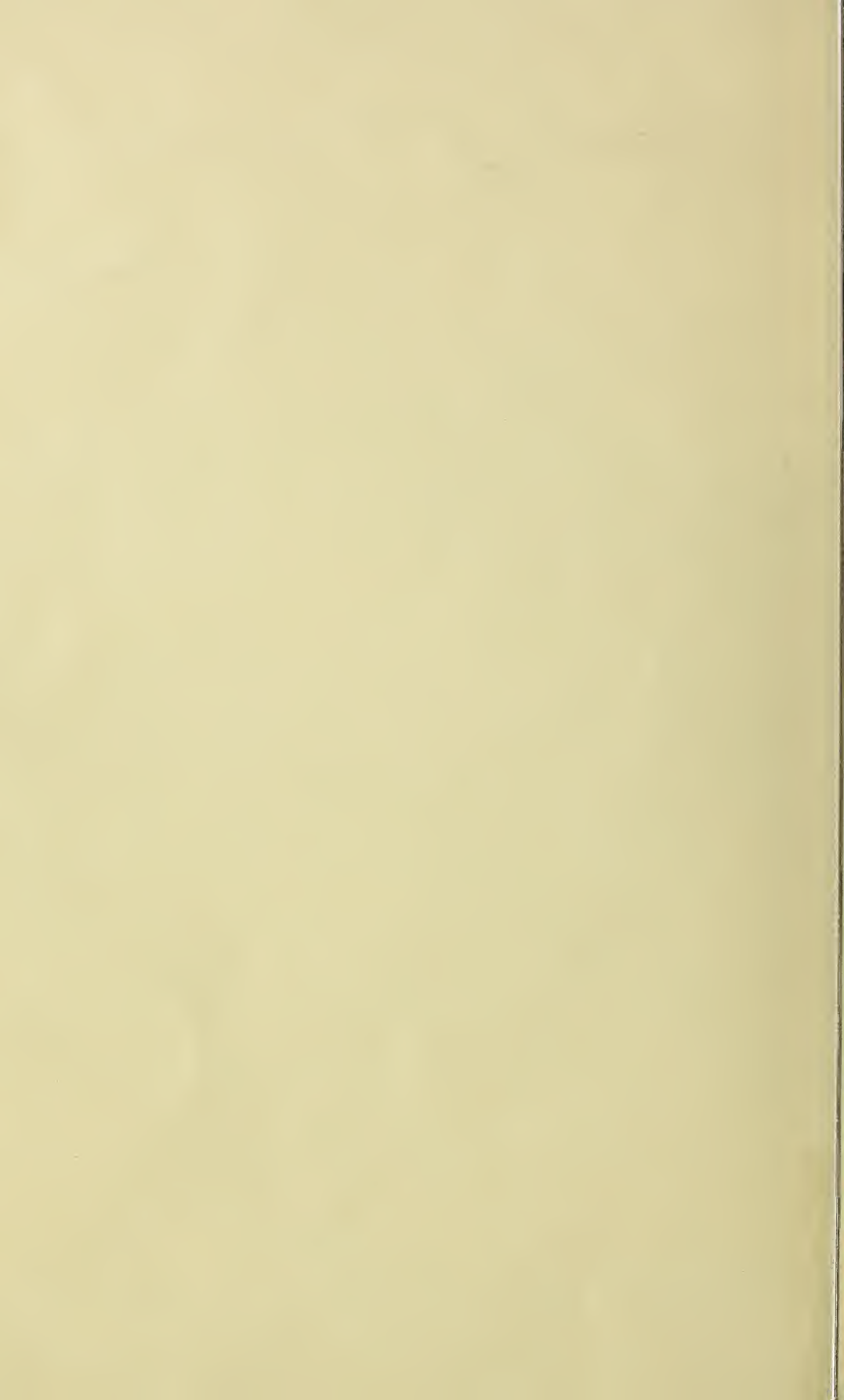


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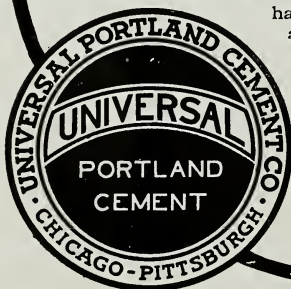
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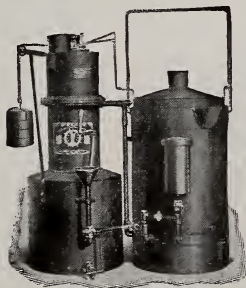
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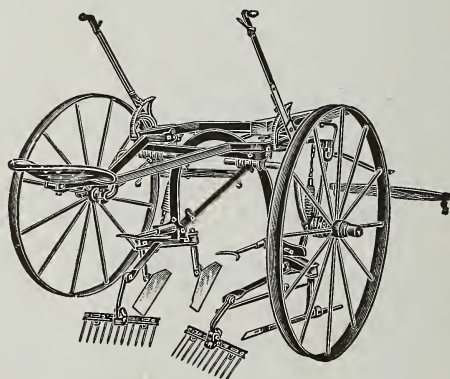
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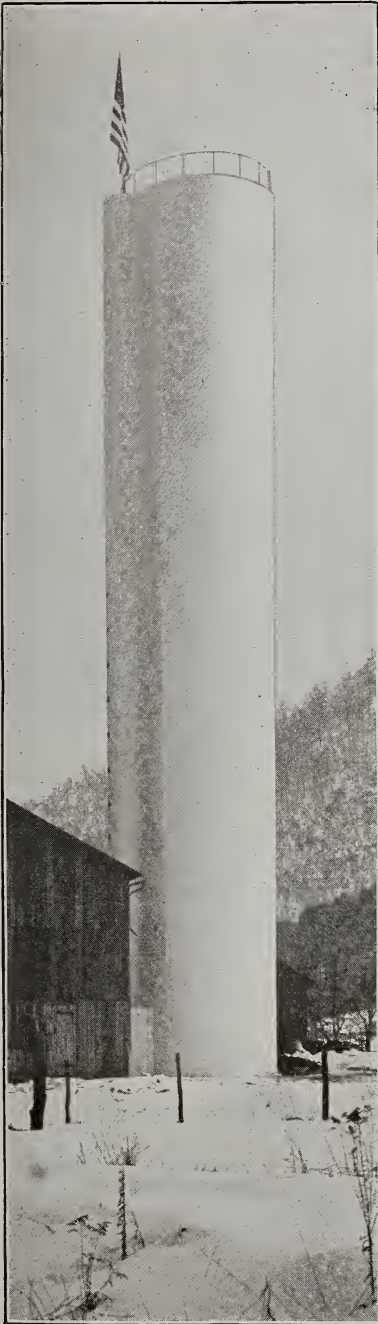
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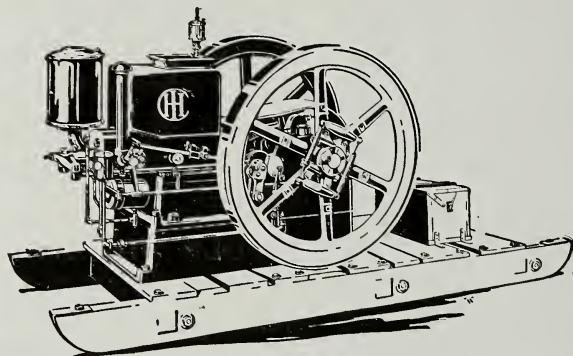
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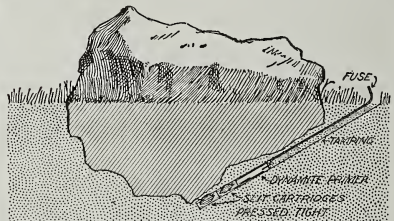
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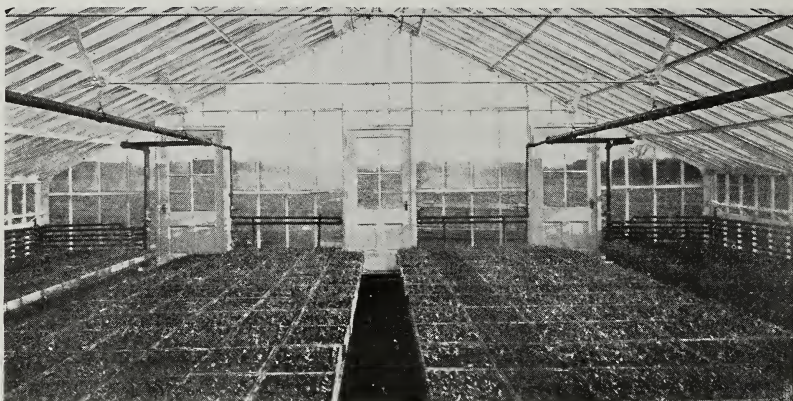
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SCENE IN CENTRAL INDIANA.

THE AGRICULTURAL STUDENT

Vol. XXI.

OHIO STATE UNIVERSITY, COLUMBUS, MAY, 1915

No. 9

THE TRAIL OF THE MERINO

W. J. CLARKE

Editor The Shepherd's Journal

THERE is much more inculcated in this simple title than most people may imagine. Since the introduction of the more modern mutton breeds into this, and other countries, the raising of this remarkable breed of sheep has to a serious extent been neglected. From certain points of view, perhaps, it is well that it has, as the demand for mutton and lamb in this country in the past few years has created a market for a class of lamb that the Merino of itself could not very well supply.

Still we must not lose sight of the fact that but for the Merino and its brethren of more modern type, such as the Delaine and Rambouillet the flocks of the west could not have been what they are today. It is questionable if flocks of such size as are carried in the west would have been in evidence without the aid of the Merino. Its wonderful shearing qualities made it possible in the past for the western flockmaster to make good returns on his investment and but for its excellent herding qualities and its ability to withstand the drought of summer and the rigors of winter, and above all, its great herding qualities our western states would not be as famous as they are for sheep raising.

With the introduction of the mutton ram into the west a radical change came over the sheep raising industry west of the Missouri River, as, indeed, it has all over the country. Mutton

and wool raising became a combination which was found to be quite profitable and many outfits became quite wealthy in a comparatively short time from this new departure, and today the fat lamb industry of the west has reached large proportions, yet with all this change we find the Merino directly or indirectly more than holding its own.

Visit our large markets, Chicago for instance, and what do we see? We see the impress of the Shropshire, that of the Hampshire, Oxford, Cotswold, Lincoln and other breeds standing out boldly and we also see very distinctly the impress of the old Merino.

In the lambs there may be directly the impress of the Delaine and Rambouillet but to the old wrinkly Merino more or less credit must be given for what we see.

Although the old Merino, strictly speaking, is looked upon as anything but a kindly feeder itself, or profitable from a butcher's standpoint; it figures perhaps as no other breed when it comes to the breeding and feeding of western lambs for the market. All breeders are a unit in saying they like Merino blood in their flocks because the lambs are kindly feeders and will put on fat better than any other breed or cross breed under western conditions.

Strange as it may appear the lamb with Merino blood in it kills ripper than some purebreds under certain western conditions. In fact few breeds in their

pure state would thrive under the conditions that the cross-bred Merino lamb does. By Merino lamb is meant those that are the product of the Merino ram or some of its family.

Purebred mutton flocks are being established in large numbers in the west at present and they will no doubt be very profitable if too many are not established, which is very unlikely. These flocks receive good and skillful treatment, which they must have to insure success. But in some sections of the west, breeders must not forget that

doing toward keeping up their Merino, Delaine and Rambouillet flocks? Are they still crying their wares in the market places or are they sleeping on their arms and leaving the wonderful work they have accomplished in breeding a class of sheep that has been in reality the building up of the flocks of the west, to the breeders of the west?

Years ago the breeders of Ohio, Michigan, Vermont and those of other states were always more or less prominent in print with letters and articles which were an inspiration and educa-



THE TIME OF THE MERINO IS COMING AGAIN.

their own flocks must be strongly impregnated with the blood of the Merino, for, if they do not they will surely land on the rocks.

There are locations in the west where as good purebred sheep can be raised as can be raised anywhere but such locations must be considered as favored grounds for the raising of stud rams for purebred flocks and for crossing. In less favored sections the pure mutton blood mixed with Merino blood will be the source of the flockmaster's profit. This brings us to the question, What are the fine wool breeders of the east

tion to the breeders of the east and those who were then the pioneers in the sheep industry of the west. Recently looking over some journals, published in the year 1893, we found articles on the Merino that were classics, showing that their authors were not only high-class breeders, but very able writers, whose articles carried weight and did wonders to educate the young and growing generation as to the value of the Merino to our sheep breeding industry. What has become of this school of breeders—writers, whose writings were as stimulating to the novice,

and breeder of purebred stock, as to the breeding of the famous old breed of sheep itself? Still with all this apparent neglect the Merino will never become extinct. Its influence is apparent on every hand; not only on the range or in a more concentrated form at our stockyard markets, but in the show ring as well. Some breeders of finewools other than the old Merino would stand aghast at the suggestion that their exhibits contained a very warm dash of Merino blood in them; but it is there nevertheless and in many cases only of very recent injection.

It is surprising what the old wrinkly Merino is doing in a semi-secret way in the flocks of this and other countries, but what it and the newer breeds of finewools will do in the future will be more surprising.

A short time since, one of the prominent shippers of fat lambs to the Chicago market remarked to the writer: "Although I have perhaps bought, bred and used as many purebred rams of the mutton breeds, as any western breeder and topped the market as many times as any other shipper, I still keep in mind what I must have for my ewe flock. Whether for herding, or feeding, I must have a heavy sprinkling of Merino blood. My ewes are of Delaine character bred up with the use of good

rams from a non-descript bunch. They are always heavy shearers and with the use of mutton rams I produce a combination of lamb and wool that insures good profits even if wool and lamb should happen to be low in price."

When asked as to what he thought of the future of the old wrinkly type of Merino, he replied: "His time is coming again. He will become extinct no more than would the thoroughbred horse should racing die out. Their blood is too valuable as a stimulant, for either to become doomed as a breed. Too many of our western herders have not hewed close enough to the Merino line for the benefit of their ewe flocks in particular and their flocks in general and they are suffering in consequence. Breeders of the Merino, in its different types, will have their day again and good rams of all the types will be at a premium in the near future. Poor rams will not be wanted at any price by reputable western breeders, although, naturally, there will be a market for some poor rams among breeders whose flocks are of a very commonplace standard."

In the face of this, Ohio and other prominent Merino breeders should take heart and not kill the "goose that lays the golden egg."

If Spring came but once in a century, instead of once a year, or burst forth with the sound of an earthquake, and not silence, what wonder and expectation there would be in all the hearts to behold the miraculous change! But now the silent succession suggests nothing but necessity. To most men only the cessation of the miracle would be miraculous, and the perpetual exercise of God's Power seems less wonderful than its withdrawal would be.

—Longfellow.

Let us rest ourselves a bit.
Worry?—Wave your hand to it—
Kiss your finger tips and smile
It farewell a little while.

Weary of the weary way
We have come since yesterday,
Let us fret us not, in dread
Of the weary way ahead.



While we yet look down—not up—
To seek out the buttercup
And the daisy where they wave
O'er the green home of the grave.

Lose all troubles—gain release,
Languor and exceeding peace,
Cruising idly o'er the vast,
Calm mid ocean of the past.

Voyage off, beneath the trees,
O'er the field's enchanted seas,
Where the lilies are our sails
And our seal gulls, nightingales.

Let us rest ourselves a bit.
Worry?—Wave your hand to it—
Kiss your finger tips and smile
It farewell a little while.

—James Whitcomb Riley.

THE PALATABILITY OF FEEDING STUFFS FOR DAIRY CATTLE

L. L. RUMMELL, '15

PALATABLE feeds as we ordinarily think of this term include those which are pleasing or agreeable to the taste. There are many feeds which the cow will eat readily or can be induced to consume, while there are others that she may refuse entirely. The subject of palatability, therefore, is attracting important as well as just attention in the modern dairy cattle world as greater dependence is constantly being

palatable; the mouth "waters" and a similar, abundant, psychic secretion takes place in the stomach in case of the gastric juice; and consequently the food is more thoroughly digested.

Determination of Palatability.

From these facts it is evident that palatability should receive our considerate attention in making up the ration for dairy cattle, for here is a case where the feeder can practice some



WHERE PALATABILITY IS DETERMINED.
Feed Room at Anna Dean Farm, Barberton, O.

placed upon this industry and in these days when the world champions are constantly stepping aside for their superiors in production.

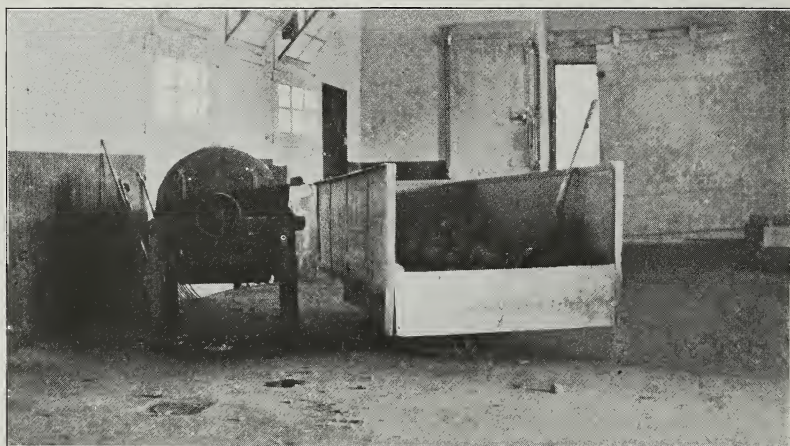
The problem, however, is of no greater importance than it has always been in the case of man himself. Physiologists tell us that foods which are pleasing to the sense of sight, smell and taste, other things being equal, are of greater nutritive value than those which are improperly selected or handled. The digestive juices flow out more abundantly when the foods are

scientific feeding methods with no greater expenditure than would be the case if he chose his feeds unwisely. Most feeders do not make an individual study of their cows to find their particular likes and dislikes; neither do these men bring their animals into the limelight of dairy cattle production.

The best feeders, on the other hand, consider each cow in the herd as a unit in feeding; incidentally, they have the public eye on them and their cattle. For instance on a certain Ohio dairy farm we find that a separate

grain mixture is fed to more than fifty cows in the test barn. A small feed room, as shown in the accompanying cut, has been provided where each feed is weighed separately and a daily record kept for each cow. Here then, is the place to determine palatability of the various feeding stuffs; here is one key to success in the proper management of dairy champions. The feeder caters to the fancies of every cow under his care; he loves his work and revels in his reward.

ment for variety in the ration; for the chances of the cow disliking the ration because of a particular component therein are constantly lessened as the number of ingredients is increased. At the same time we have the added advantages from variety of making changes without shocking the system of the cow, of supplying protein in different forms, and of increasing the chances of providing a ration that consists of ingredients of which the cow can make the most efficient use.



SUGAR BEETS OWE THEIR VALUE TO PALATABILITY.

In determining the palatability of the various feeding stuffs certain grain mixtures are given to the cow to see which she will eat most readily. Then one feed may be substituted for a certain component in the mixture and the results noted with each ingredient as it is introduced into the ration. Ultimately the feeder learns the fancies of each cow in the herd. This is one argument for having a long period for preparation of the dairy cow for a test period; some feeders wish to have at least a year's time to know how the cow behaves in summer and winter under various conditions and feeding practices. Moreover, here is an argu-

Palatable Feeds.

Among the concentrated feeding stuffs prepared dairy feeds take a high rank as regards palatability, and to this factor alone they owe their chief value. This is due to the fact that many of the prepared feeds have molasses or salt added as appetizers; they may not contain any more or as digestible nutrients as the same weight of some mixed grains. Of the latter feeders are generally agreed that bran, oats and distillers' grains are quite palatable to the average cow. Corn and hominy will rank somewhat lower.

Beet pulp and sugar beets owe their value not entirely to the amount of

protein and carbohydrates they contain, but more particularly to their palatability. All cows relish these feeds especially during the winter months when succulent feeds are not ordinarily available. Where the root crops can be easily and cheaply grown, they should form a considerable part of the ration for the dairy cow.

Among the dried roughages alfalfa and clover take a front rank as regards palatability. Cows eat these feeds with avidity and because of this fact along with their high percent of nutrients, they should be the dairyman's base for the roughage of the ration. The first cutting of clover is often weedy and the stems are frequently tough because the plant gets a rank growth. The second cutting is much to be preferred for cattle feeding. If we used the same care with our clover crops as we do with alfalfa the former would make the more desirable hay. Alfalfa in general is more palatable because of the greater care taken in handling it.

The palatability of silage depends upon the manner in which this feed is handled. If the corn is cut when the lower leaves are just beginning to turn brown and the grain is commencing to dent, the resulting silage should be relished by the cows. However, if the corn is cut too green, it results in sour silage because of the formation of certain acids. If the corn is cut too late

and is dry or improperly packed, molds will form.

Green feeds probably assume a greater importance than dried roughages as regards palatability. Green corn, oats, peas or soy beans are common succulent crops for supplementing pastures or dry lot feeding during the summer months and much is to be said in their favor.

Unpalatable Feeds

The roughage that is unpalatable to the cow should be withheld. With concentrates, however, it is often desirable that the cow be taught to eat certain feeds that at first seem displeasing to her. Cottonseed meal, linseed oil meal and flaxseed meal are ordinarily never relished by the cow the first time they are offered to her; she must be induced to cultivate a liking for them because of the high nutritive value placed on these feeds for all successful dairy cattle feeding practices.

Some other feeds especially high in oils and fat, such as peanut meal and coconut meal, are frequently fed to high producing cows, but in many instances it takes perseverance to induce a cow to eat a mixture containing one of these ingredients. Their successful use can come only through experimentation with the mixtures containing other additional ingredients and by long continued inducements to increase the cow's desire for these unpalatable feeding stuffs.

*What makes the landscape look so fair;
What blossoms bright perfume the air,
What plant repays the farmer's toil,
And will enrich the worn-out soil?*

Alfalfa!

*What makes all the stock look nice,
And brings the highest market price;
What fills the milk pails, feeds the calf,
And makes the old cow almost laugh?*

Alfalfa!

NOTES ON OHIO WOODLOTS

O. W. PFLUEGER
Ohio State University

MOST of the timber in Ohio today is contained in farmers' woodlots, which is all that is left in this state of the great Central Hardwood Region. A few scattered tracts of larger area occur in the southern portion of the state. The following figures tell the story of wantonless forest destruction in the past half century, in a manner that is plain to the ordinary person. In 1853 the forested area of Ohio was 55 per cent of the total area; in 1870, 38 per cent; in 1881, 23 per cent, and in 1910, 18 per cent. In 1899 Ohio, Indiana and Illinois produced over two billion board feet or 25 per cent of the hardwood timber used in the United States, while in 1906 or only seven years later they produced only one billion board feet or 14 per cent of the total used in the United States. In 1899 Ohio produced 2.8 per cent of the total lumber cut of the United States and in 1910 only 1.2 per cent. In other words Ohio lost about 1.5 per cent in about a decade. Another set of figures illustrates more clearly the same point: in 1850 Ohio ranked fourth in the United States in lumber cut; in 1900, her rank was seventh; and in 1910, twenty-fifth.

These figures show that most of the forested areas of the state have been depleted and that most of our future yield of timber in this state must come from the farmer's woodlot. Therefore, this phase of forestry must receive more attention in the future and some radical measures will have to be taken to induce the farmer to care for his existing timber and also to plant more. The woodlot problem is receiving a great deal of attention in other states

and in Ohio the experiment station has done much along this line already and is blazing the way for other organizations to follow in its path.

Nearly every farmer owns a woodlot, from which he gets his own supply of posts, rails and firewood and often he has additional land from which he cuts wood for market. As he expects to cut successive crops of trees from this land, he should make every acre of it produce as much wood as possible. The average sprout forest grows at the rate of only .6 to .7 cords per acre per year, and on account of excessive crowding many of the trees are crooked and unfit for timber use. By using forestry methods, the actual annual production of wood per acre can be raised 20 to 40 per cent and even the quality of the wood can be improved as most of the trees will be straight. The improvement of the woodlot enhances the sale value of the farm also.

A farm without a good woodlot is incomplete. As a general rule about one-eighth of the total acreage of the farm should be devoted exclusively to timber growing. A woodlot serves other uses beside the timber crop it yields; for example, it provides protection from winds, reduces the danger from frosts, and in case it is near the barnyard serves to give shade to the animals. As far as possible the woodlot should occupy waste land not suitable for farm crops, such as steep hillsides, ravines, swamps, creek banks, rocky slopes and corners cut off by ditches, creeks or railroads. Such localities will sustain a good growth of timber and become an important source

of revenue. Forest growth protects steep slopes and river banks from erosion. If there is no waste land on the farm the woodlot should be so located as to furnish the best protection. Most of the land in Ohio is pre-eminently agricultural and the removal of the timber was a necessity in the earlier days, but this cutting has been carried to excess. Most of the demand for timber now must be supplied from the outside. The problem now confronting the state is to restore at least part of our depleted stock of timber and there is sufficient waste land in Ohio adapted to forest growth, which if properly employed will provide an adequate and perpetual supply of timber for local uses and prevent the loss of many important industries.

In general the main operations necessary in woodlot forestry are as follows: (1) thinning in woods not mature to improve conditions for growth; (2) cutting in mature woods so that reproduction will follow quickly; (3) protection of the forest from fire, grazing, wind-fall, etc.; (4) restocking of waste land by planting or sowing.

The protection problem in Ohio woodlots merits considerable attention. By far the greatest damage is done by allowing grazing in the forest, which is one of the greatest factors in preventing the reproduction of our forests. Go into the ordinary farm woodlot and note the absence of young growth caused by allowing the stock to graze in the forest. Another indicator of this condition is the presence of a heavy grass sod and the conse-

quent absence of humus and leaf cover on the ground. In some localities of the state, notably the southern counties, protection from fire must be afforded.

Granting all the above to be true the greatest problem still remains: What must be done to improve the condition of the farm woodlot in Ohio? This condition may be brought about in the following ways: (1) by a general educational propaganda throughout the state. The farmer could be taught the necessity of preserving his timber by means of extension lectures, and by special lectures in the farmers' institutes. Very little of this is now done and it is a most important subject and should not be neglected; (2) by state aid in reforestation; (3) by the passing of a law giving the farmer tax exemption on land producing timber crops; (4) by a greater and more general co-operation on the part of the state, with the farmer, along the lines now being carried out by the experiment station; (5) by the setting aside of state forest reserves in certain non-agricultural portions of the state. This would serve as an example to the farmer and induce him to better the condition of his own timberland.

The problem of the farm woodlot is an important one and merits careful consideration, and unless something is done in the near future we will find ourselves in the condition of having no timber resources whatsoever, thus losing many important industries that will have to move to some locality where the timber supply is better.

"In the woods the very sounds make the silence more evident and refreshing. The murmur of pines, the song of birds, the rustle and fall of leaves, the ripple of the brook, conspire to preserve the essential silence even while they seem to violate it."

—Mabie.

PERMANENCY AND PROFIT IN PUREBRED LIVESTOCK

GILBERT GUSLER
Ohio State University

EARNEST promoters of the new agriculture hope soon to see permanent systems of agriculture adopted. The conception of the soil is to be changed from that of a storehouse to that of a working factory which by the processes of nature converts the raw material into a finished product. Experience justifies the belief that these permanent systems of agriculture will include systems of stock farming. Indeed, it would appear that as the place given to live stock becomes more promi-

great agricultural needs of the time is more intelligent action upon established principles of live stock production.

The ordinary farmer now concedes the value of purity of breeding, but the ordinary kind of live stock, at present prices, still pays some profit or at least does not bankrupt its owner. Hence the less progressive adhere to its use because of the lower investment, yet each day sees additional converts to a belief in the efficiency of the really



THE OUTLOOK FOR PURE-BREDS ASSURES PERMANENCY AND PROFIT.

nent, the permanency of the form of agriculture also increases.

The outlook is for a future both permanent and profitable in the business of producing purebred livestock. Only a small percentage—a mere nucleus—of our farm animals are pure bred. The public marvels at the excellence of the showing tops, but the rank and file in the country still manifest a woeful need of a tincture of this improved blood. For reasons not far to seek, skill in producing crops has outrun skill in producing live stock so that one of the

good animal, and farmers and stockmen advance in the use of improved blood to make their farm stock more profitable. The many who are working in this direction are making heavy demands upon the professional breeder and as the level of the masses rises these demands become more and more exacting in order to accomplish real improvement.

The manufacturer is continually beset by the danger of having the foundation cut from under his business by some invention or discovery which may

change the methods and costs of production, or the form of demand and to strike at the vitals of his enterprise. Places in the industrial world are relatively insecure. But the young man who contemplates going into the purebred business can do so with full assurance that he will not be left suddenly stranded high and dry on the reefs of economic change or industrial shift. No business which banks upon the future is safer. Our ancestors were herdsmen. Abel was "a keeper of sheep," Abraham was "very rich in cattle," which are still "on a thousand hills." Changes in agriculture come slowly. As it evolves into permanency the systems of stock farming included, will attain permanency. Breeding establishments started now upon sound principles may hope to persist for generations.

There have been occasional lapses in prices for pure bred but these have never sprung from over production. Abnormal conditions in finance, as the panic of 1893, reduce the demand abnormally and prices register the effect, but the business has never overdone itself. In 1893 the meat producing pure bred were cashed in numbers for what they would bring as killers. Horses were worse off because there was no such outlet for them. Light horses have been hard hit recently by the increasing use of motor vehicles, but the utility value of the former was never on such a basis since they were primarily bred for pleasure purposes. Despite the much discussed beef shortage prices for pure bred beef breeding cattle do not indicate a lack of prosperity. During the last ten years the auction sales of shorthorn breeding cattle, reported in *The Breeder's Gazette*, have averaged \$170 per head. Aberdeen-Angus, \$175; Herefords, \$147; Polled Durhams, \$138; and Galloways, \$119. Prices dur-

ing the last two or three years were as good as any.

The breeders of fine-wool sheep seem most subject to the vicissitudes of fortune, but whether always on the crest of the wave or not they have come through the storms unbroken. Commercial wool producing flocks have been sorely buffeted, but the pure bred flocks of high merit are going on and conquering new worlds in South America and South Africa.

The young man formulating his life plans will wish to deal in things of solid foundation even though he may be ambitious for varied experience before the race of life is run. The steady wants of mankind for food, raiment and burden-bearing must be ministered unto. It is doubtful if the chemist will ever be able to manufacture human food entirely in a laboratory or even make beans as palatable as beefsteak. Furthermore, we are all born barefooted. In ministry to these needs animal husbandry will always have its part.

A stable business must expect a moderate and honest profit. There are no short cuts to wealth in this field. It is not an opportunity for the mere opportunist. Haste must be made slowly in entering the field. profits must be in the kit of the live stock breeder.

There is no better training for entrance to the field of purebred production than apprenticeship served in producing market stock of the kind contemplated. The principles involved are similar, although methods are somewhat different. Then the change should be made slowly or the methods changed quickly. Since this work is not a game of change, but a real business, there is not occasion for jumping at it.

Wise planning before making a single purchase of foundation stock will

go far toward obviating mistakes and failure. First the line of production to which the section is adopted must be decided upon, as well as mortgage-lifting qualities needed for greatest service in meeting the peculiarities of the situation. Then pick the old established breed in which these qualities are most often present.

In the purchase of the foundation stock quality should be the deciding factor. The purse should not be made to go too far. The size of the herd purchased, not its quality, should be in proportion to the purchaser's means. There is no easier method of increasing the value of the produce than by using good seed. The foundation stock selections will dominate the character of the herd for a long time. By selecting most of the foundation from one herd, having the qualities desired in high degree, uniformity in the increase will be secured. There is no greater incentive than pride and if but a few good ones are purchased then the produce of the owner's matings will be especially prized.

The best of the produce must always be kept. The higher the quality the easier to sell. It is hard to sell poor stuff, but bids will constantly tempt one to sell the good ones. Sales must always be from the bottom or presently there will be no tops. By this means it is possible to make the herd or flock possess some characteristic excellence which will make it known above all others.

The breeder himself must keep growing. He must try to penetrate the processes of nature and attend to all sides of a rather many-sided business. He must adopt business like methods, use the standard means of bringing his herd to public notice, develop ability as a salesman and sell stock that will give

satisfaction and make money for the buyer. Integrity is necessary here.

He must keep ahead as to types needed, though he need not run wild after the fads of fashion. The type once selected should be adhered to unless outside conditions change. Popular demand is only to be followed when it has a utility squint. The breeder must have patience for time is required to change animal form and he should not blame the stock if he is not as successful as anticipated. Breeders make or mar their herds, which in turn make or mar the breeder.

The possibilities in store are a greater fixity of type than we have yet seen in the masses and a raised level all along. Go to the best of the flocks and herds and too many are below standard. A world champion is one in thousands. The stream cannot rise above its source. To elevate the race the fountain heads of improvement must be higher and higher. Probably nature does not ordain that she shall be completely mastered so there will always be something to strive for, some ground to gain. As long as the scrub, whether pedigreed or not, is on the map there will be need for the highest effort at improvement. The whole lump must be more than leavened; it must be made into leaven itself.

The interest in breeding operations is potent to hold the attention and ambition of generation after generation. Find the farm where son has followed father for generations and it will usually be a farm where the live stock interest has been strong. The more numerous such occurrences become the more permanent will be the character of our agriculture, and those who are engaged with the fountain heads of type creation and improvement will find permanent profit therein.

THE DRAFT OF PLOWS

R. E. CROUCH, '16

DURING the course of a lecture on farm machinery last year Professor H. C. Ramsower of the department of agricultural engineering deplored the lack of data on the draft of plows. In order to get some data upon this subject Fred F. Searle and the writer started a series of tests which

All possible attachments were secured such as coulter, jointers, and beam wheels, and various combinations were made such as might be used on the average Ohio farm, the idea being to get some data which would be of benefit to Ohio farmers.

About six acres of timothy sod was staked off for the tests, which were conducted on the University farm west of the Olentangy River. The sod here was very good, in fact so good that the farm superintendent had considerable trouble making up his mind to plow it under for corn this year to preserve the proper rotation.

The draft was measured by means of a recording dynamometer which was hitched between the clevis of the plow and the clevis of the doubletree, thus unavoidably lengthening the hitch. The recording dynamometer is simply a spring balance which records continuously the pull in pounds exerted upon its end links.

Owing to the impossibility of plowing a furrow exactly eight inches deep and fourteen inches wide every time, it was deemed best to reduce all data to the basis of draft per square inch of furrow slice turned, though this is really not an exact method of comparison as the draft per square inch of furrow slice will vary in the same plow depending upon what relation there is between the depth and width, considerable of the draft being due to the cutting of the sod by the shin of the share. The celebrated plow trials at Utica, New York, in the sixties showed that 55 per cent of the draft of the plow was caused by the cutting of the furrow slice, 35 per cent by the friction of the sole against the bottom of the



THE RECORDING DYNAMOMETER.

form a thesis for our Bachelor's degree in agriculture. The co-operation of a prominent plow company was readily secured and four plows were obtained from their stock room. The following types of plows were tested: (1) A chilled iron walking plow with sloping landside; (2) a soft center steel walking plow with straight landside; (3) a frameless sulky plow with same style bottom as 2; (4) a highlift sulky plow with same style bottom as 2.

furrow, and only 10 per cent by the work of lifting and turning the furrow. While these figures will not hold for all conditions, yet even an approximate idea of the division of draft explains many frequently observed facts.

There is usually quite a discussion as to whether a sulky plow has a heavier draft than a walking plow so a series of bare plow tests were made without attachments of any kind. It was found that while the chilled iron walking plow had a draft of 5.78 pounds per square inch of cross section of furrow-slice, yet the steel walking plow had a draft of 6.12 pounds or an increase of 5.88 per cent over the chilled iron walking plow. The frameless sulky, with a 140-pound driver seated upon it, had a draft of only 5.66 pounds, or a saving of 2.08 per cent over the chilled walking and a saving of 7.52 per cent over the same bottom when on a walking plow. The high-lift sulky plow, though its weight was more than the frameless had a draft of 5.40 pounds per square inch, which was 6.57 per cent lighter than the chilled walking, 11.77 per cent lighter than the steel walking, and even lighter than the frameless sulky plow by some 4.60 per cent. This shows that it is possible to add the weight of a heavy plow frame and a driver to the load of the horses and yet not increase the draft. The explanation of this is that the friction of the sole, estimated at 35 per cent of the total, is transferred almost entirely to the wheels in the sulky plow. The lifting of the soil is borne by the larger wheels and frame, while the relatively small moldboard friction remains constant. In addition to this gain there is also the advantage of eliminating the variation in draft which an unskilled plowman might cause by constantly disturbing the adjustment.

In these tests we had the help of the best plowman on the university farm, a man whose furrows were very straight and in many tests did not vary more than an eighth of an inch in depth, nor more than a half inch in width on the average of eleven measurements made every 20 feet apart along the 200 foot furrow length.

The rolling coulter is claimed by the late Prof. F. H. King to reduce the draft in sod ground from 21 per cent to 25 per cent, while Sanborn, formerly of Utah and Missouri, claimed that it increased the draft from 10 per cent to 15 per cent, due to the tendency of the coulter to raise the plow out of the ground. Our results showed that adding a rolling coulter to the chilled walking plow lessened the draft by 0.87 per cent, as the plow with the rolling coulter had a draft of only 5.73 pounds per square inch. This would tend to support Prof. King's theory to a slight extent. The addition of a rolling coulter to a frameless sulky plow, which also had a jointer, had the effect of neutralizing the increased draft of the jointer, as the bare plow pulled 5.66 pounds, and with the jointer it pulled 5.88 pounds, while when the rolling coulter was also put on, the draft was reduced to 5.64 pounds, or a decrease of 0.4 per cent over the draft of the bare plow, and a saving in draft of 0.24 pounds or 4.08 per cent over the plow with the jointer alone. The addition of a rolling coulter to the high lift sulky plow increased the draft to 6.33 pounds per square inch or an increase of 17.2 per cent over that of the plow without the rolling coulter, thus apparently bearing out Sanborn's idea but not for the same reason; for the weight of the plow in this case is carried on the beam which is in turn supported by the wheels. On the walking plow it

would appear to be a good thing to add, especially if one were using a jointer.

The addition of a jointer to the chilled walking plow increased the draft to 6.10 pounds, or an increase of 5.6 per cent. On the steel walking, the jointer decreased the draft to 5.41 pounds, or a reduction of 11.6 per cent. The same jointer could not be used on both plows due to the sloping land-side of the chilled walking plow. The jointer on the frameless sulky plow raised the draft to 5.88 pounds, or an increase of 3.89 per cent.

The beam wheel should theoretically increase the draft by adding friction and by frequently disturbing the line of draft as it encounters obstructions. We found that by adding it to a chilled walking plow, which already had a jointer, it not only reduced the draft to 5.60 pounds, or a saving in draft of 8.26 per cent over the same plow with the jointer, but the plow with both beam wheel and jointer together had less draft than the bare plow alone, as there was a saving of 3.12 per cent.

A fin coulter on a steel walking plow reduced the draft to 5.39 pounds, or a saving of 11.0 per cent. The quincy cutter on the same plow reduced the draft to 4.88 pounds, a saving of 20.3 per cent, but it required an extra man to walk alongside to keep the sod from rolling up under the beam and raising the plow out of the ground. This cutter is more suitable for hazlebrush, etc.

When we put on a curved hanging or knee coulter on the steel walking plow we found that it reduced the draft to 5.41 pounds per square inch or 11.6 per cent.

In the above figures no statement is given as to the width and depth of the

furrows, but the attempt was made to plow a furrow 8 inches deep, which is from 2 to 3 inches deeper than the average farmer plows his land. The width was maintained very closely to 14 inches throughout all the tests. The total draft is calculated by multiplying the draft per square inch by the number of square inches of the cross section of the furrow slice. The average durable working draft of a horse is found to be about one-tenth of his weight, though for about an hour a horse can exert a tractive force of about one-quarter of his weight, while for a very short length of time he can exert a force of about one-half of his weight.

The total draft of a plow is dependent upon numerous factors, each of which will vary under different circumstances. Among these may be considered the weight of the plow, its shape, the various adjustments, the condition of the plow with respect to sharpness and scouring properties, the angle of draft, the character of the soil, the skill of the plowman, the presence and adjustment of various attachments, the speed of travel, the size of the furrow, and others of less importance. The annual plowing bill of the United States may be estimated at approximately \$450,000,000, so it will easily be seen that any improvement which will save even 5 per cent will amount to a considerable saving over the country.

A better understanding of the draft of plows would undoubtedly lead to greater profit and more humane treatment of animals. No farmer would think of pulling a wagon loaded with three tons uphill all day, yet two horses are frequently called upon to do as much in plowing.

OHIO AT THE PANAMA-PACIFIC EXPOSITION

MELVIN RYDER, '15

MAPLE sugar, honey and sugar beets are among the varieties of Ohio sweets that are included in the agricultural exhibit now installed in Ohio's space in the Palace of Agriculture at the Panama-Pacific Exposition at San Francisco. The many separate exhibits and demonstrations that present the agricultural prominence of the Buckeye State were installed by Clark S. Wheeler, supervisor of the Extension

graphs will aid in presenting the natural advantages and the progressive methods found in the state "were the rainbow comes down."

One side of the room will be covered with paneled drawings showing growing grains of the varieties raised profitably in Ohio. A gigantic pair of scales shows the eleven record-holding cows, including Murne Cowan, champion Guernsey cow of the world, balancing



ONE OF THE FEATURES OF THE OHIO DISPLAY.

Department, and N. E. Shaw, chief of the Bureau of Orchard Inspection of Ohio.

Fields of corn and alfalfa, farm scenes, interiors of canning factories, dairies, experiment station views and college settings in natural colors, on backgrounds of green velour tapestries will cover the walls of the sixty-foot square room reserved for Ohio in a prominent central position in the Agricultural Palace. Eleven enlarged photo-

graphs will aid in presenting the natural advantages and the progressive methods found in the state "were the rainbow comes down."

Prominence is given to every phase of agriculture. The grain farmer, the fruit grower, the gardener, the truck farmer, the specialists in tobacco culture, bee culture, sugar beet growers, and the greenhouse operators will find

themselves represented at the exposition.

That Ohio ranks first among the states in the yield of corn per acre, in corn value per acre, in the yield and value of oats per acre, in maple syrup production and in the number of lambs per farm and on the farms are discoveries made in the preparation of the exhibits and of an illustrated booklet for free distribution. Fourth place in tobacco production and third in valuation of wheat per acre has also been found among last year's records for Ohio. These comparisons will be shown with other states in a graphic manner.

Fifty pounds of framed honey, flanked with jars of extracted grades and preparations made by prominent producers is a case that is expected to attract attention. A prodigious fleece of wool, weighing 37 pounds, will be found in the exhibit of wool grown on

Ohio sheep. Prof. C. S. Plumb's collection of wool products has been augmented by choice samples of this spring's early shearing and will be displayed in special glass cases. Grain seeds by the millions in numbers and hundreds in varieties will make up large case display. Tobacco, in every state from natural growth to final manufacture into cigars and fancy compounds, prize seed corn collections of various colors and varieties, sections of Ohio's wood and timbers, and several hundred pounds of maple syrup and sugar will be found in other sections of the Ohio department.

A rest room and facilities for writing have been arranged for the convenience of all Ohioans who visit the Agricultural Building at the Exposition. Attendants will be on duty at all hours. The Exposition Commission urges all to make the Ohio booth a meeting place with their friends.

MY PURPLE HILLS.

L. H. Bailey.

Far over the valley are purple hills
Afloat in a twilight of haze;
I think there are fountains and falling rills
And aisles a-dream in th' forest ways;
I think there are birds with a song that thrills
And winds that roam in th' quiet days.

But the space between has a deep morass
With tangles and bogs that I fear to pass;
There are quaking hollows and sinking sands
And white burning suns on the sterile lands;
There are bottomless streams with luckless shores
And hedges of briars on the log-piled floors;
Blind depths I must cross and cliffs I must scale
That stand like walls in the dread intervale.

Yet I think that I see the falling rills
In the depths of the twilight bar,
And I listen to catch the song that thrills
Falling down from the aisles afar;—
I am jorun'ying on to my purple hills,
And over the hills is a star.

GLIMPSES OF OHIO BEEKEEPING

E. R. ROOT, Medina, Ohio

OHIO has the distinction of having been the home of L. L. Langstroth, one of the fathers of American beekeeping and the man who invented the first practical movable-frame hive. This was probably the most remarkable invention ever made in beekeeping, an invention which revolutionized the craft throughout the world. Apiculture has risen from a little noticed, almost insignificant pursuit, to a branch of agriculture requiring the services of hundreds of commercial experts and trained scientists by the advances made possible through his invention. Mr. Langstroth removed to Oxford, Ohio, in 1858, later to Xenia, and finally to Dayton where he died in 1895. A minister by profession but a beekeeper by choice, his name is revered by thousands of beekeepers throughout the world.

In this line, Ohio has one more distinction, the fact that more is invested in apiculture in the state than in any other state or similar portion of the globe. This is on account of its being the location of the largest corporation manufacturing bee supplies and distributing honey products. The total capital invested in apiaries alone is large, although some states, such as Pennsylvania, New York and California, exceed Ohio somewhat in this particular.

A course in apiculture is given in Ohio State University. The state government makes no definite appropriation for bee culture, but the interests of

beekeepers share with those of other farmers in the general appropriation for agricultural purposes. N. E. Shaw, state entomologist, is state inspector of bee diseases and supervises a corps of deputies who inspect apiaries and give instruction in methods of preventing and curing bee diseases. Ohio has also one of the best bee disease laws in the country, one which has been widely copied in other states.

With the intensive methods of agriculture due to density of population, bee pasturage in Ohio is not as extensive as in mountainous and sparsely settled parts of the country. In order to be commercially profitable, bee culture requires a great deal of waste land. For this reason Ohio does not rank as high as other honey producing states.

In the apple growing districts beekeeping is coming to be a very important factor. Fruit growers are realizing that bees are necessary for the perfect pollination of large numbers of fruit trees and that in order to have the greatest quantity as well as the finest quality of fruit, they must provide bees. The researches of experiment stations, universities, and the federal government have shown that so many varieties are sterile to their own pollen or benefit highly from the pollen of other varieties, so that the prudent fruit-grower must provide enough bees to pollinate his orchard regardless of weather conditions.

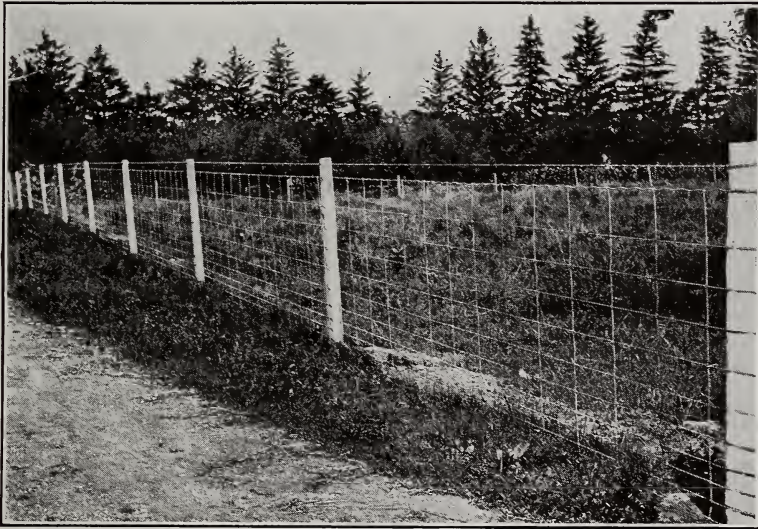
CONCRETE FENCE POSTS

WHERE cement is easily obtained and proper aggregates are available, which applies practically to the greater part of the United States, farmers are finding it profitable to substitute concrete posts for posts of wood. Wooden posts are temporary at best, and in some localities decay within a very few years.

Concrete posts are indestructable, keep in better alignment than wooden posts, and, under normal conditions,

dividual. This is a very good plan as metal molds do not warp or decay.

The easiest and cheapest wooden mold to make is the straight mold, or one for a post which does not taper. Such molds are merely long boxes having various devices for making the molding of the post a simple matter. On account of the amount of lumber saved and the ease with which these molds are filled, straight molds are generally made in "sets" or "gangs,"



ATTRACTIVENESS AND PERMANENCY.

cost little more if as much as the latter. In some sections of the country they can be made cheaper than good wooden posts. Their fireproof and everlasting qualities make them especially desirable. A simple type of a post can be easily made on the farm. A farmer may make his own molds, or he can purchase them from one of the various concerns that manufacture molds on a large scale. Farmers sometimes club together in purchasing factory or metal molds, thus reducing expense to the in-

by constructing several side by side with a continuous bottom and end piece.

Posts should be reinforced with a rod or wire in each corner. In most cases round bars three-sixteenth or one-fourth inch in diameter are used.

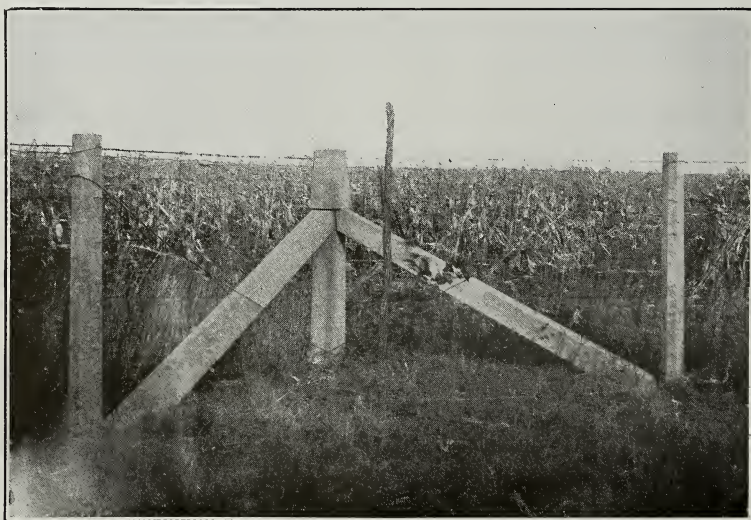
After the molds have been oiled or soaped, the concrete should be placed in them at once. If, for any reason, the concrete stands thirty minutes before using, it should be thrown away and a new batch mixed, for cement, if it has

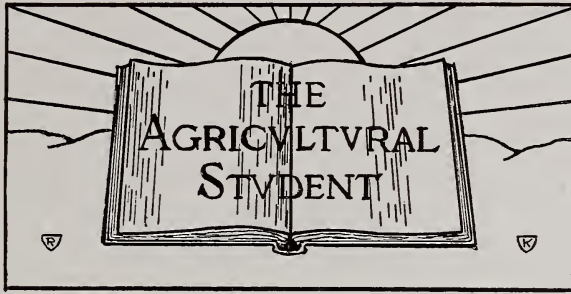
once partly set, makes weak, dangerous concrete, even though it is tempered by tuning or adding water. After the molds are filled evenly to the depth of three-fourths of an inch or one inch, according to the spacing of the reinforcing rods or wires, the reinforcement should be laid in, properly spaced by means of at least three "fool-proof" wire spacers. The concrete should then be poured in until the molds are filled within three-fourths of an inch or one inch of the top, when the remaining reinforcement is fitted in place in the manner described above and the molds are completely filled. To render the concrete more compact, a crowbar or a pinch bar should be placed under each corner of the mold successively and moved up and down quickly. This vibration makes the concrete more compact by shaking out the air bubbles, but there will be very few of these bubbles if the concrete is thoroughly mixed and of proper consistency. If desired, the exposed corners of the post may be beveled with an "edger" and the open face given a neat finish by using a trowel immediately after the surface water has been absorbed and

before the concrete has become too hard.

The following are exceedingly important precautions: Do not expose the newly made posts to wind, hot sunshine or frost. Do not remove the mold from the green post until thoroughly hardened, which generally requires two or three days. Even then the post must remain on the bottom board in the shade and not be disturbed for at least a week. During the first two days keep the post wet and covered with canvas, burlap or other clean material, and dampen it thereafter each day for about a week.

The Mixture: In mixing the concrete, if unscreened "bank-run" gravel is decided upon, it should be used in the proportion of 1 part of cement to 4 parts of gravel. For crushed rock or screened gravel (which is much better than "bank-run" gravel), the concrete should be used in the proportion of 1 part of cement, 2 parts of sand, and 4 parts of rock gravel. All measurements should be made with the material poured loosely into the measuring box, and the box, when full, should be carefully leveled.





OF

OHIO STATE UNIVERSITY.

A MEDIUM FOR EXCHANGE OF IDEAS BETWEEN COLLEGE AND FARM

Published by the Students in the College of Agriculture.

Established 1894.

Subscription Price, One Dollar the Year.

Entered at the Postoffice at Columbus, Ohio, as Second Class Matter.

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COLUMBUS, OHIO, MAY, 1915.

EDITORIAL

As we watch the throngs of students in this great state university the question arises, have the students a voice? Are they in a restricted sense men and women who come to the university merely to absorb knowledge? What share should the student take in voicing his sentiments as regards policies and men with whom he is associated in a great maelstrom of university life, amid the storms of politics and the mad waves of life's great sea?

By answering those questions you have solved one of the most serious problems with which the college student has to deal. He sees about him those who instruct him along various lines with views often colored by per-

sonal observation, study or prejudice. The student reasons, and rightly so, that his opinion is as good as that of another. The question comes, When, Where and How shall he raise his voice?

Then again comes to him the question of political activities either in his immediate environment or in the commonwealth at large. He is a factor in the development of his surroundings and his nation; he is a force for good or evil in a rapidly advancing social and industrial world; he is one link of a great human chain. Why, then, should he not consider himself in this light—a unit in the wall of humanity, one of those whose concerted whole goes to direct the destinies of this nation? Why should he not assume the attitude of "I am the Captain of my Soul?"

There is one phase of this question, however, that should not be overlooked. The student should not use his voice merely for lamenting. As one writer has said "Voices were given to men for singing, or calling, or pleading, or explaining, or commanding, but rarely for wailing." As we think of those words we can readily make for them an application. We see on the one hand the student who among the many has the nerve to voice his opinion. He expresses himself for a thing that will make justice more certain or life sweeter by his so doing even in the face of his opponents. He restricts his voice or probably his pen when he has nothing to say.

Then on the other hand we have the student who has nothing to say and wants everybody to know it. He knocks a worthy cause, a step taken for progress, a noble ideal that would insure justice to all concerned. And if there is any student that the college of tomorrow should disclose, it is he who is ashamed to back his words openly, he who works in the dark amid the shadows of shame and self conviction, he who has a grudge at himself and society in general. But by this disclosure and along with it the honest expression of an honest conviction of the other student will our college ever be exalted, its organizations will become a stronger force pulling up the stream of co-operation and sociability, and its students will form a more friendly, a more united and a more prosperous citizenship.

A letter came to our desk recently from the pen of an upper classman in the agricultural college. We did not criticize the phraseology of the letter, but we did count ten separate mistakes that

should be discernible to any college man had he read the letter. This is only one of many similar examples that come to our notice; it only goes to show a weak point in our educational system.

Now that the student is making up his schedule for next year, it is well that he consider some of the courses in English given in the Arts College. One of the places for improvement in the agricultural college curriculum is in regard to the study of the mother tongue. The student himself realizes this fact only after the opportunity for attaining this knowledge and training is past.

He may be called upon to contribute articles to the agricultural press but the means for expression are lacking or only partially developed. Too many articles appearing in farm journals are void of meaning or at least do not convey the meaning intended by their writers. Too often do the articles require a "liberal application of the editor's pencil" before they can be put in the printer's hands. This is almost equally true with the college student and the ordinary writer for the press.

Again, the student may be called upon to appear upon the platform but the effect of his words is lost because he has not developed the powers of proper expression. The day of effective public speaking is not past. It is true that we do not have many Daniel Websters today, but we do not want that class of orators. Modern man has a different viewpoint on oratory; for today we demand of a public speaker a short, terse and concise expression of policy or action. This power comes only through long continued training along this particular line.

With the agricultural student in particular this subject should not be overlooked. Fellow Students, sign up for a course in Public Speaking, Journal-

ism or Exposition for the next year and you will be assured of as great benefits from this training as from the study of cattle, corn or apples.

During the past few years over 600 graduates have gone out from the agricultural college

OUR COLLEGE OF AGRICULTURE. to engage mainly in agricultural activities or close-

ly related vocations over the state. Many have gone directly to farms, others to professional work, some to teaching, etc., but all are interested in the advance of agricultural conditions. Practically every community has a few young men taking either a long or a short course.

The extension department has given a week's schooling on agricultural lines in every county; in addition special demonstrations have been carried out in many sections. The experiment station, which is closely allied with the college, having a number of graduates on its force, has planted the seeds of better agriculture by establishing county farms, plot tests and co-operative experiments in addition to its work at Wooster. The cow testing associations which are looking after the interest of the dairymen of the state owe their origin and continuance to the agricultural college. The state department co-operates with the college with many educational features. The county agriculturists are nearly all graduates of the college and are required to send weekly reports to the dean of the college concerning their work. Lastly, many of the members of the instructional force in farmers' institute work have been students of the college of agriculture or are in perfect sympathy with its work.

Hence, we see that the college is in-

timately connected with every other agricultural factor in the state which is educational in nature. In view of these facts we as students and farmers should consider the college from a broader viewpoint; we ought to realize more fully the place it will have in molding agricultural advancement. Surely, it is the duty of every student to make his value felt and to do his part in carrying out this propaganda.

With the appropriations which come to the university this year, a definite amount is in-

HOME ECONOMICS BUILDING included for a new Home Economics Build-

ing which will be placed between the Botany and Horticulture Buildings, thus completing the agricultural group with those buildings and Townshend Hall.

For a number of years the needs of such a building have been quite evident. Practically the same equipment which was installed when the course was first given remains in use, although the enrollment has risen from 12 to nearly 300. Under such conditions Ohio State could not continue to maintain her reputation of having the best home economics course in the middle west. Possibly the greatest need for such a building was felt when it was found that no adequate room or equipment was available for the instruction of the 200 women of the state who attended the Farmers' Week course last winter.

Home economics is being recognized as the most important subject in the education of the young women at the present time. Old theories and traditions of women's work and education are quickly disappearing; professional home-making has come to its own and

many homes are now managed by women who put intelligent thought into their work.

Moreover, the professional side of home economics requires that a large number shall be trained to become institutional managers, dietists or teachers. The public schools are developing the subject to some extent; hence, the necessity for a department properly prepared to train teachers for this work. No building erected on the campus during the past twenty years will be appreciated so highly or, will its resulting efficiency be greater than that of the Home Economics Building.

Assistant Secretary of the United States Department of Agriculture, Carl

PRACTICAL Vrooman, was a city
OBSERVATION reared lad who obtained his love for country life by attending an agricultural college. Later he graduated from Harvard and then took a degree from Oxford, England. His training did a great deal to fit him for his present position but his real training came from his actual contact with farm laborers on his 4,500 acre

farm in Illinois. There he had an opportunity to observe real conditions from both the tenant and the landlord standpoint. He was able to grasp every detail and weigh it for what it was worth.

After all many of our pet hobbies concerning agricultural theories must necessarily be relegated to the background and the results of simple observation substituted for them. One student may have an intense desire to practice livestock farming yet a careful study of conditions when he actually begins may reveal that horticulture is better adapted to his locality; or the reverse may be true. Often we see examples of a community primarily adapted to dairying trying to maintain a system of grain farming without success. Even when one farmer has established a system which proves profitable, others often fail to follow his example.

Practical observation is often more valuable than years of training but the combination of the two will be ideal. The farmer who lays his foundation by scientific training and then uses his best judgment and observation to supplement it will undoubtedly succeed.

Truth is within ourselves; it takes no rise
From outward things, whate'er you may believe.
There is an inmost centre in us all
Where truth abides in fullness, and "to know"
Rather consists in opening out a way
Whence the imprisoned splendor may escape,
Than in effecting entry for a light
Supposed to be without.

—Robert Browning.



Training the boy is entirely left to the parents when school closes. Some farmers wish their sons to become farmers and some do not. Those who think that their children could do better in other lines of work do not hesitate to allow them to study for such and to receive training along that line. The man who wishes his son to take up the same business as himself, follows a definite plan in preparing the boy for that work. He not only gives the youngster the results of his own experience but he interests him with the actual workings of the business. Not satisfied with that he has him learn the up-to-date methods and to follow the instruction of those who make a specialty of training people. Business concerns have been known to train men who were actually "green" to their line of work. They do this because they know that it pays to train men who can think.

Now returning to the farmer who does not believe in training and yet wants his son to take to the farm. Does he think he can give the proper training? Perhaps he can but those who can are few. Is it a business proposition? Should the son be more successful than the father? Should both get their knowledge by hard knocks? No, they should not. Competition is

keener between men today than it was a few years ago. The opportunities to succeed with old methods are not as great as they were at one time. While training is not experience it saves years of time in the end. Common mistakes are eliminated to a large extent and shorter methods are used to reach the coveted ends. Train the boy. There is joy in it.

An agricultural high school has been proposed for one of our counties and it seems that its organization is certain. This is a great step in the public school world and Ohio is among the leaders. What can we predict for such schools in the years to come? Is there a place for them in our educational system? It is planned that some of the work done in these schools will receive credit in the college of agriculture. This bridges a wide gap as few people have an opportunity to attend an agricultural college and little is accomplished under the present system where the time devoted to the subject is so limited.

"Judging Draft Horses" is the subject of a bulletin recently published by the extension department of the Ohio State University. This bulletin is especially adapted for the use of pupils who expect to enter the Boys' Judging Contests this fall. It is well illustrated and the explanations of the points of the score card are such that any one can understand them. Other bulletins will follow which will take up the subject of other kinds of livestock. Since the county judging contests are becoming so popular and the prizes to county teams are so valuable, it is proper that each county superintendent should see that his county is represented. For further information in this regard see the April issue of this magazine.

MANUAL TRAINING IN THE AGRICULTURAL HIGH SCHOOL

E. L. USRY
Ohio State University

IT IS now a firmly established fact that manual training is entitled to serious consideration in the curriculum of the modern school. The problem now is not that of the adoption of manual training in the schools, but its aim, and this is a very much debated question. Shall the course prepare the student for a trade or shall it be purely cultural? Both are extremes and the best opinion seems to have practically concluded that the "golden mean" must be sought. This mean is not neces-

sary the delicate and highly complex municipal problems were still in the future. Life centered about the home, and its comfort and success depended largely upon the ability to meet the problems presented daily, without the aid of another's co-operation. If the wagon or fence or barn door failed to fulfil its duties, it was up to the father or son to take a hammer and some nails, and any other tools that they were fortunate enough to possess, and repair the part that was defective.



A HIGH SCHOOL CLASS IN WOOD WORK.

sarily the half-way position, but rather a position between the two extremes determined largely by the local environment. Take for example a community dependent for existence upon its industrial achievements. There manual training should lean toward the industrial side, but still retain part of the cultural element.

The determining facts in manual training teaching is the community—its life, traditions, and present interests. Up to the middle of the last century the family was the chief unit of the people. Industrial activities and

In recent years this early training, through necessity, has been generally neglected and the question has arisen as to the efficiency of manual training as a means of restoring the early familiarity with tools and their use. The successful farmer must equip his farm with modern machinery and by all means should be an all-round mechanic in order to keep it in an ever-ready condition. There is no better time to develop this ability than in the period of youth, and at this critical point manual training can be of valuable assistance, not by making trades-

men out of the boys, but by giving them a general knowledge of materials, tools, and tool processes. Along with these three necessary and visible elements the boys should be given as many fundamental ideas and as many varied lines of work as possible.

It can easily be seen that a knowledge of material is completely dependent upon the use of tools and that the knowledge of the use of tools can only be acquired by having material with which to work. If the work is properly arranged and carried out, a self-reliance, not otherwise attainable in this kind of work, will be gradually developed and the boy will be able to cope with the problems of constructing a window screen or shingling the barn.

But carpentry work is not the only branch to be considered. Blacksmithing in its simpler phases can be treated, as can the subject of farm machinery repair work. In the winter, when the greater part of the machines are idle, they can be studied and used for demonstrations. Then, too, the winter season affords a splendid opportunity for the work in cabinet-making. Although handwork has practically been displaced by machine-made products, there is still a respect for and a pride in the work of the human hand and head. In the products of the hand every defect shows plainly the lack of skill and is an excellent indicator of the ability of the boy to use the tools at his command. In fact, it is an axiom that the best mechanic is the man who can do good work with the fewest possible tools. There are countless numbers of small articles that can be made that add wonderfully to the convenience and "hominess" of the home, and what is more they can be made out of material found about the farm. All the tools required are the common car-

penter tools plus the ever-present jack-knife. It is safe to say that these requisites are found in every farm. But the one thing needful is the boy with a skillful hand and fertile ideas. It is these two qualities that it is the duty of manual training to develop.

Today the main business of the school is to make one capable of adapting himself readily to the community in which he locates—to live, not in the sense of individual existence, but as an efficient member of our higher and greater unit we call society. Hence, manual training will have an important part in such as development, if, in attacking suddenly presented problems, it can give fundamental ideas and a self-reliance both of which are necessary in every phase of life.

Two factors have yet to be considered and upon them depends largely the realization of the aim of manual training. These factors are the instructor and the equipment. The matter of needed equipment tends to defeat its aim. But it should be thoroughly practical. It should contain the usual carpentry tools and the necessary cabinet-maker's tools. For forging the tools used in ordinary work should be secured and, if necessary, a forge can be made from a barrel and some loam and clay.

In taking up the matter of the man in charge, there are three main qualifications absolutely essential; viz, he must be acquainted with and in sympathy with farm work and farm life; he must be intensely interested in the boy; and he must have a lot of practical information and skill. All three are of first rank importance and if only one is lacking the value of manual training in developing and broadening the boy is seriously handicapped.

AGRICULTURE IN THE CITY HIGH SCHOOLS

A. P. JONES

East Technical High School, Cleveland, Ohio

THE time has arrived when agriculture must be taught in the city. The boys and girls of the city are not content today without having some knowledge of agriculture. Even the professional, business and practical men and women are becoming interested in the science of agriculture. School teachers of the grade school are all preparing themselves along these lines.

A person can hardly ride in the street cars of the city today without hearing discussions of agricultural problems. It has aroused the interest of the rich and poor alike. It has even brought the farmer into closer contact with the people of the city. This shifting of sentiment and interest toward agriculture has largely been brought about by newspaper publicity, school and home garden associations and private individuals.

So strong and urgent was the demand for the teaching of this science that last September the Board of Education of East Technical High School of Cleveland, added a course in agriculture to its curriculum. Even this did not satisfy the public, so an evening class was started and 33 men and women of various occupations enrolled. Young and old, business, professional as well as practical came to study and learn of agriculture. School teachers, college men and women were also unsatisfied with their previous training and joined the class so that they too could say they were up-to-date.

The course offered in the evening is somewhat different from that offered to the day school students, although in dealing with both classes nothing of

importance is overlooked along farming lines.

Cleveland offers every opportunity for the scientific study of dairying, fruit growing, vegetable gardening, landscape gardening and poultry husbandry. Weekly trips are made and hours spent in solving farm problems. Many Saturday afternoons are spent in practical work with the classes. Hundreds of dollars' worth of annuals, biennials and perennials have been planted by the classes. A neglected orchard of two hundred or more trees has been pruned, sprayed, mulched and managed by the class.

Experiments in budding and grafting have been carried on with unusual success. Testing of seeds for the city lawns and parks have also been part of the work. Mechanical and chemical analyses of the soil have also been made. The art of tree surgery has had a great deal of attention. Experiments in the treatment and preservation of diseased and decayed trees has interested many.

Aside from this there are at the command of the school an excellent greenhouse, cold frames, and hot beds beside an acre of land to carry on gardening.

Each boy and girl in the day school must be a junior or senior. Some of these boys have had farm experience and nearly all plan to work on farms this summer. Next year nearly all members of the classes expect to go to college to pursue agriculture. The night class being adults and mostly married, plan to go into farming, or devote their spare time to agriculture;

some will teach it while others will manage their own farms. Now after a year's work, it appears to the writer to be a very successful attempt with an exceptionally promising future. Words could not express the interest and enthusiasm displayed by both the day and evening classes, where all kinds of farm problems are worked out and discussed.

A HIGH SCHOOL FARM.

The question of land in connection with agriculture in secondary schools is today still in the balance. No one seems to advocate and no one seems to be against it. Statistics show that many schools have small farms in connection, and Eugene Merritt, Assistant in Agricultural Education of the U. S. Department of Agriculture, has shown that more than 50 per cent of the schools, having farms and teaching agriculture, maintain that the school farm is necessary.

At present the movement of population is from the farm to the city. Something must be done to interest the child in the farm; the common labor of doing chores does not interest him. He wants to experiment and experiment he will, so why not let him work along agricultural lines? If we are to reach these children we must reach them before they get out of high school, for the census of 1910 shows that out of the 18,009,000 children attending school in the United States 44 per cent were be-

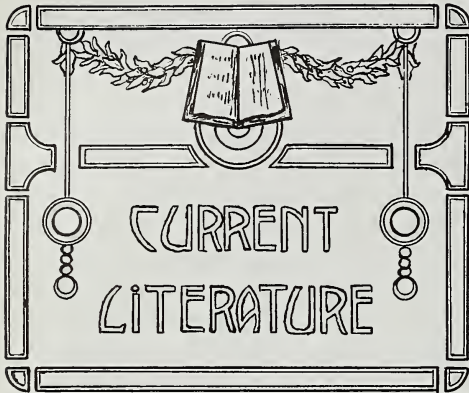
tween the age of 10 and 14 years of age; 20 per cent between the age of 15 and 20 years; and only 1.7 per cent were 21 or over. This shows that only a small percentage of the children ever go to college and so the breadth of their education depends upon their high school training.

It should be remembered in all vocational training that the boy or girl is always of more importance than the subject taught. So why should the education of the future generation be neglected because of the lack of proper apparatus and means? If it is worth while to have a college farm for the few that go to college, it is far more important to have a high school farm for the large number that never have the opportunity to get a higher education.

Why will a boy work all day building a dam that will be washed away by the first rain? Because he is the manager and sole "boss." After the boys or girls have become interested in agriculture, they should be further interested by home projects, such as corn contests, tomato clubs, etc. All these things play their part in getting the child in closer contact with the farm.

The school that teaches agriculture without a farm is like the fairy tale. The subject is read over and soon forgotten; but if a few practical experiments had been used with the reading, the subject would have been impressed so deeply that they would never have been lost.





Any of the following books may be obtained directly from the publishers or through *The Agricultural Student*. Special combination offers are given with this magazine.

“Castration of Domestic Animals,” by F. S. Schoenleber, D. V. S. and R. R. Dykstra of the Kansas Agricultural College, presents the latest teachings and findings on this subject, both in America and in Europe. A very detailed explanation is given to each division of this subject. To the ordinary farmer this book will prove a great help. 150 pages, illustrated. Cloth, \$1.25. Orange Judd Co., New York.

“College Zoology,” by R. W. Hegner, Ph. D., of the University of Michigan, is one of the most complete books of its kind and is intended to serve primarily as a college text book. The economic relation of animals to man as well as the relation of the various phyla to each other is one of the chief points of excellence of this text. The book is very complete, clear and comprehensive in its makeup. 733 pages, illustrated. Cloth, \$2.60. The Macmillan Company, New York.

“Chemistry of Cattle Feeding and Dairying,” by J. Alan Murray, B. Sc.,

is a technical treatise of this subject and is adapted to college students who know the fundamentals of chemistry. The constituents of plants and animals, requirements of animals, analyses of feeding stuffs, constituents of milk, etc., are given the greatest importance. For the student of dairying and cattle feeding this book will prove invaluable, 343 pages, illustrated. Net, \$1.75. Longmans, Green & Co., New York.

“Productive Feeding of Farm Animals,” by F. W. Woll, Professor of Animal Nutrition, University of California. In this book we have the results of a store of experimental work sifted by an expert in feeding problems. The book is one of the most comprehensible, systematically arranged and yet practical treatises on this important subject of live stock management. The various types of feeding stuffs and the feeding of the different classes of farm animals are carefully taken into consideration. 362 pages, illustrated. Cloth, \$1.50. J. B. Lippincott Co., Philadelphia.

“Agriculture and Life,” by A. B. Cromwell, M. Ph., professor of agriculture at State Normal School, West Chester, Pa., is a text intended for Teachers’ Reading Circles and Normal Schools, and comes from the pen of a long experienced teacher of agriculture and nature study. The main idea in the book is to present a workable plan for teachers in agricultural instruction and to correlate the subjects in their relation to practical home activities of the students. Such subjects as plant breeding, stock judging, farm management, insects, and rural organizations receive most attention. 369 pages, 143 illustrations. J. B. Lippincott Co., Philadelphia.

"Ornamental Gardening for Americans," by E. A. Long, landscape architect, is a treatise on beautifying homes, rural districts, and cemeteries. Practical and clear suggestions are given along with numerous illustrations. 300 pages. Cloth, \$1.50. Orange Judd Co., New York.

"Foot and Mouth Disease," is the title for Farmers' Bulletin 666, written by J. R. Mohler, D. V. M., Assistant Chief of the Bureau of Animal Industry. The nature and characteristics of the disease both in America and in Europe, its prevention and eradication are dealt with in detail. The subject of foot and mouth disease in man is also presented.

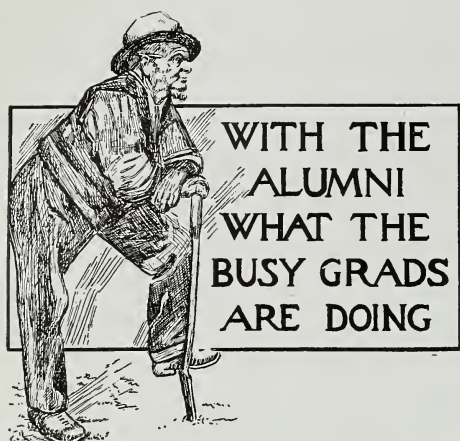
The New Hampshire Experiment Station has recently issued Technical Bulletin 9 on "Studies in Fruit Bud Formation," written by J. H. Gourley. Summaries of work started in 1908 to produce an annual bearing Baldwin apple tree are presented in a thorough manner. The results of the experiments indicate that the yield may be considerably increased in the off years by cultural methods.

"Poultry Keeping" by Harry R. Lewis, B. S. of the New Jersey Experiment Station, is the latest publication of this expert in poultry culture, and is one of the most practical books dealing with this subject. Hatching, housing, feeding, poultry products, diseases, and general management are treated in a systematic, complete and thoroughly practical manner. 365 pages, illustrated. The J. B. Lippincott Co., Philadelphia.

"Van Pelt's Cow Demonstration" is a small booklet written by Hugh G. Van Pelt, a long time cattle judge, which will be of great aid in teaching the student the methods of judging dairy cattle. Completeness and directness is the aim of the writer. Full page illustrations serve to make the discussions more clear. 85 pages. Price 50 cents, or with The Agricultural Student one year \$1.15.

"Gas, Gasoline and Oil Engines," by Gardner D. Hiscox, M. E., has just been enlarged and revised by Victor W. Page, and includes a description and discussion of all types of stationary, marine, motor vehicle and aerial power plants. This is one of the most complete and systematic publications dealing with modern explosive motor construction. The student, engineer or the practical man will find this a simple and useful treatise. 640 pages, illustrated. Net, \$2.50. The Norman W. Henley Publishing Co., New York.

"York State Rural Problems," by L. H. Bailey, formerly dean of Cornell University, has just been issued in a second volume. As with Volume I this book presents those problems which are of vital interest to the present day agriculturist, and while the illustrations are taken from New York state, yet the problems are presented in such a way that they may be adapted to other communities. Extension work, biological surveys, boys' and girls' contests, fairs, the country life movement, and the influence of the agricultural college are a few of the subjects presented. 262 pages. J. B. Lyon Co., Albany, N. Y.



G. F. Snyder, '05, is making a specialty of sheep farming at Monroeville, Ohio.

G. J. Wilder, '05, is secretary of The American Lime & Limestone Association, Hartman Building, Columbus, Ohio.

G. A. Crabbe, '05 is adjunct professor of agronomy at the University of Georgia.

Frank D. Heckathorn, '06, is a nursery inspector for the state department at Painesville, Ohio

Glenn Foster, '05, is the manager of a large estate in southern Ohio.

E. R. Minns, '05, formerly an instructor in Cornell University, is now a county agriculturist in New York state.

Fred L. West, '05, is a real estate dealer in Bloomingburg, Ohio.

"Jimmy" White, '05, is the manager of a horse breeding farm near Delaware, O.

F. L. Allen, '06, is a livestock farmer near Van Wert, O.

Ray Donahue, '06, is head of the agronomy department of the North Dakota Agricultural College.

J. W. Hammond, '06, associate in the animal husbandry department of the Ohio Experiment Station, announces the birth of a son.

Maurice Laird, '07, is the manager of several farms near South Salem, O.

S. H. Shawan, '07, is farming at Xenia, Ohio.

E. C. Richey, '07, formerly dean of the agricultural college at Ohio Northern University, is now professor of agronomy at Purdue University.

Burt Miskimen, '08, is specializing in sheep farming at Newcomerstown, O.

Max E. Corotis, '08, is district agent for the Midland Mutual Life Insurance Company, Columbus, Ohio.

A. R. Moist, '08, formerly manager of the Sheffield Farms, Glendale, Ohio, is now connected with the Bureau of Animal Industry of the U. S. Department of Agriculture and is working on horse breeding investigations in the southern states.

S. B. Stowe, '08, was a recent visitor on the campus. He makes a specialty of raising hothouse lambs at Leesburg, Va.

R. C. Wright, '08, a bacteriologist in the Bureau of Plant Industry of the U. S. Department of Agriculture, is located at Riverside, California.

Stanley Hart, '08, is farming at Campbellstown, Ohio. Livestock is his specialty.

Byron Hendrix, '08, is taking chemistry work for a doctor's degree at Yale.

G. C. Long, '09, is in the draft horse business at Cardington, O.

L. H. Burgwald, '14, has charge of the manufacture of soft cheese and fermented milk at the Morian Farms, Dayton, O.

O. W. Reagin, '09, is an instructor in the Texas Agricultural College, College Station, Texas.

B. W. Anspen, '10, is an instructor in floriculture and landscape gardening in Maryland Agricultural College, College Park, Md.

Sleeter Bull, '10, is in the animal nutrition department of the University of Illinois. He is the author of several recent bulletins.

J. M. Cadwallader, '10, is in the dairy department of Mississippi Agricultural College.

R. C. Clum, '10, is farming at Thornville, Ohio.

W. H. Darst, '10, is head of the crops department at Pennsylvania State College, State College, Pa.

L. L. Mowls, '10, is engaged in live-stock farming at Bayard, O.

L. M. Oyler, '10, is farming near Okeana, Ohio.

G. C. Portz, '10, is farming at Newcomerstown, Ohio.

Chas. M. Richardson, '10, is a dairyman near Willoughby, O.

Paul Barnes, '11 is farming near Glendale, Ohio.

W. M. Bembower, '11, now at Allahabad, India, expects to take his Master's degree in horticulture at the University of California next year.

H. M. Call, '11, is farming at Kent, Ohio.

W. E. Hanger, '11, is engaged in crops extension work for the extension department of Ohio State University.

Harry A. Marsh, '11, is farming near Amlin, Ohio.

O. W. Pflueger, '11, is an instructor in the forestry department at Ohio State University.

Lawrence Wright, '11, is practicing dairy farming at New Vienna, O.

A. M. Bell, '11, is engaged in general farming at Utica, O.

C. B. Clevenger, '12, is working towards his Doctor's degree in chemistry at the University of Illinois.

E. D. Blaine, '11, is specializing in hog raising at Mt. Sterling, O.

L. W. Boving, '12, is farming at Carroll, Ohio.

Joe Cox, '12, is in the agronomy department of the Michigan Agricultural College, Lansing, Mich.

Marion Detrick, '12, is farming at Bellefontaine, O.

W. E. Dobbs, '12, is the manager of a farm near Cleveland, O.

W. C. Dutton, '12, is an instructor in horticulture at Michigan Agricultural College, Lansing, Mich.

C. G. Fieldner, '12, is in the lumber business at Ney, O.

H. C. Hoyt, '12, is farming at North Fairfield, Ohio.

O. A. Jamison, '12, is an instructor in the Maine Agricultural College, Orono, Maine.

L. E. Melchers, '12, '13, is a plant pathologist at the Kansas Experiment Station, Manhattan, Kan.

M. L. Nichols, '12, is farming at Bellevue, O.

Virgil Place, '12, has recently been appointed to the position of county agriculturist of Wabash county in Indiana.

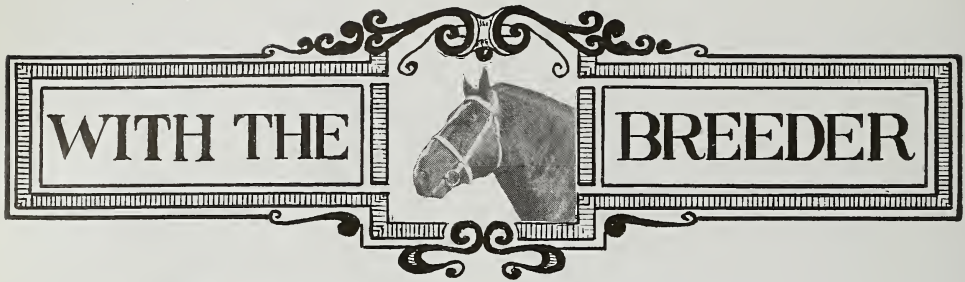
W. F. Schulpp, '12, is an agricultural representative for the English government in South America.

L. B. Smith, '12, is farming at Germantown, Ohio.

A. E. Taylor, '12, is in the forestry department of the Ohio Agricultural Experiment Station at Wooster, Ohio.

J. A. Taylor, '12, is farming at Peoli, Ohio.

H. R. McAnall, '14, is engaged in livestock farming at Iberia, O.



CARE OF THE FOAL.

No work will prove more remunerative to the farmer at this season than the proper care of pregnant mares and those with foals by their sides. The loss of a single draft foal is a serious consideration and the watchful caretaker who spends sleepless nights at foaling time is usually well repaid for his efforts.

As the date of parturition approaches the mare should be relieved of the severe farm work, but still given plenty of exercise. Parturition should occur in a clean, dry, roomy box stall that has been thoroughly disinfected and bedded with clean straw; or, if the weather is favorable, there is no better place than upon a bluegrass pasture. Thorough sanitation prevents an infection of the umbilical cord by filth germs, which cause the dreaded navel and joint disease, resulting in such great mortality among newly born foals.

The foal should always receive the first milk or colostrum which acts as a natural purgative and cleans the digestive tract of the accumulated fecal matter. If this is not accomplished, stoppage of the bowels, another common cause of death of foals, results. To relieve this condition two ounces of castor oil is often very effective.

After foaling the mare should not be worked for a period of two weeks. This gives her an opportunity to strengthen her system and affords the young foal

the proper start. The mare should receive regular exercise and nourishment in proportion to the physical condition of the foal. If the milk flow is excessive and the colt shows a tendency to scour the feed should be reduced. The ration of the dam should consist largely of milk producing feeds such as oats, bran, clover and alfalfa, with carrots or bluegrass for succulence.

If the foal is in good physical tone, at the age of two weeks, liberal feeding of the mare should be practiced. A colt makes the largest and most economical gains while nursing the dam. Most foals when three or four weeks old begin to munch at the grain and hay. They eat only a small amount at first, but soon consume considerable quantities if given the opportunity. At this time there should be provided for the foal a separate feed out of reach of the dam. Oats and bran with a small amount of oil meal and some choice alfalfa make a very satisfactory ration. The colt should be fed all that he will clean up regularly in order to make the greatest gains. Corn is too fattening and hence should be fed very sparingly during the first year.

If liberal feeding has been followed the colt will suffer practically no setback when weaned at the age of five or six months. Draft foals should be kept steadily growing with no periods of semi-starvation and attain fully one half of the mature weight by the time they are one year old.

RECENT DAIRY RECORDS.

During the past few weeks a comparatively large number of dairy records have been broken. The chief among these is the new world's champion, Finderne Holingen Fayne 144551 a Holstein, owned by the Somerset Holstein Breeders' Company, Somerset, N. J., that produced in 365 days 24,612.8 pounds milk and 1,116.05 pounds fat.

The Ayrshire cow, Imp. Garciough Spottie, owned by Highland Farm, Bryn Mawr, Pa., finished her test with 22,589 pounds milk and 816.25 pounds of fat, thus winning the Ayrshire cup in the mature cow class, and making her the second leading cow of this breed.

Lilith Piebe De Kol, a Holstein, owned by Emblagaard Dairy, Big Bay, Mich., recently finished a yearly record of 25,599.4 pounds of milk and 1,150.6 pounds of butter, which places her as the second greatest cow of any breed in milk production.

Elmside Nudine Segis Johanna 172795, a Holstein, owned by the City of Cleveland, recently broke the world's record in milk production in the junior

two-year-old class by producing 22,802.3 pounds of milk, containing 706.4 pounds of butter fat.

EASTERN PERCHERON FUTURITY.

All spring and summer foals of 1914, foalbed in America and eligible to registry in the Percheron Society of America, are eligible to compete in the Eastern Percheron Futurity, which will be held at the Ohio State Fair this fall. This show is conducted by the Ohio Percheron Breeders' Association and in addition to the finances of this organization receives the support of the Ohio Fair Board and the Percheron Society of America. The allowances made by these three organizations along with the entry fees will amount to approximately \$1,000, which will be divided equally between the stallion and filly classes in twelve prizes to each class.

Entries for the futurity contest must be in the hands of the Secretary, D. J. Kays, Ohio State University, before June 1, 1915. An entry fee of \$5 is charged for each colt, \$2 of which must be paid by June 1 and the remainder by July 15.



ELMSIDE NUDINE SEGIS JOHANNA,
Owned by City of Cleveland.



H. P. Davis, a dairy specialist for the U. S. Department of Agriculture and Prof. Oscar Erf, head of the dairy department, have been engaged for the past few months in the organization of cow-testing associations in different parts of Ohio. Associations have been organized at Newark, Belleville, Minerva, Delaware and Pataskala.

One hundred and sixty-three co-operative cow-testing associations were in operation last year in the United States, according to reports of the U. S. Department of Agriculture. The first association was formed at Fremont, Michigan, in 1905, and as late as 1908 only six associations had been formed. The next year, however, the number rose to 25, but is still far behind Europe, where there are between 2500 and 3000 of these organizations.

The main purpose of the association is to enable its members to hire a tester to keep the records which, in practice, are impossible for the farmer to keep. The tester spends a day of each month weighing and testing the milk of each cow in the herd. At feeding time he weighs the grain given each cow and estimates the amount of roughage. He also keeps a record of the feed given to the dry cows as well as those in milk, since the total cost of the feed for the year must be taken into consideration. From the figures thus obtained it is possible to estimate

the amount of the milk and butter fat given in a month by a cow and set against it the amount of feed consumed. So accurate has the system become that the results are within 2 per cent of the cow's actual production.

That a cow testing association does actually pay has been proved conclusively. In seven herds in Michigan the average yield for each cow was increased from 1908 to 1913 more than 50 pounds of butter fat; while the increase in profit was \$28.85.

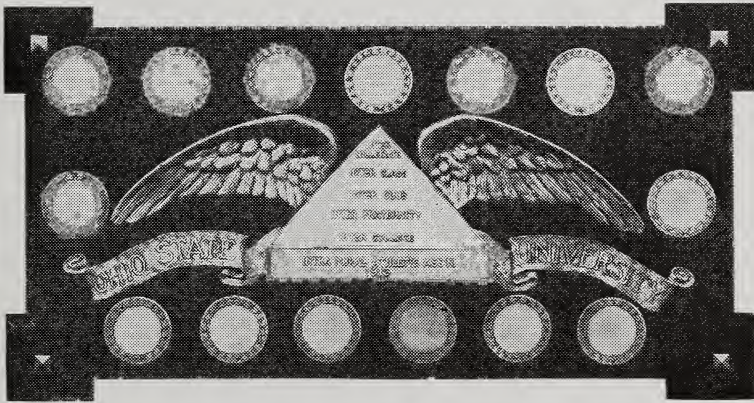
In Ohio seven cow testing associations have been formed, five of which are still in existence. The first of these was the Western Reserve Cow Testing Association established in 1908 at Burton, Geauga County. This association was disbanded after one year because of the dissatisfaction caused by the tester. It is estimated that within the next year more associations will be formed in Ohio than in all previous years. The record of the Winona Cow Testing Association is particularly significant because of the fact that until very recently the average yield per cow was the largest of any similar association in the United States. The 232 cows in this association averaged 5,920 pounds of milk and 297 pounds of butter fat, returning \$55.95 above the cost of feed. A Michigan association now holds the first place by a very small margin.

"Agriculture is the newest science, and it is the hope of the laborer today" said Carl Vrooman, assistant secretary of the United States department of agriculture at the fourth agricultural banquet held at the Ohio Union, Friday evening, April 23, at which about 250 attended. "Science is the product of the truth seeker, but it must be interpreted into dollars and cents, for we live in an economic age of civilization," he said.

Mr. Vrooman outlined briefly the work of the U. S. department of agriculture in bringing about better rural

he studied at Oxford, England. Later he returned to America and was elected to the U. S. Senate. In addition to his duties as assistant secretary of agriculture he manages a 4500 acre farm in Illinois where he spends his time in studying agricultural problems with the farm laborers.

S. R. Guard, '12, associate editor of The Breeder's Gazette responded to a toast "As the Grad Sees It;" Prof. Donald J. Kays of the animal husbandry department on "Farm Boys;" Prof. H. C. Ramsower, of the agricultural engineering department on "Pulling for



INTRA-MURAL TROPHY.

conditions. "The Smith-Lever agricultural extension bill will make it possible for the humblest farmer to receive information for the department through the system of county agriculturalists and agricultural colleges. Such a system when in operation will increase the income of the farmers of the United States \$10,000,000 for every growing day in the year on corn and wheat alone. This act will mark an epoch in the agriculture of mankind," he continued.

Mr. Vrooman, at one time a student of Kansas Agricultural college and a graduate of Harvard was raised in the city. After graduating from Harvard

the College;" Prof. Vernon H. Davis, of the horticulture department on "The Student Farmer;" and L. L. Rummell spoke on "The Student's Voice" in behalf of the senior class. Prof. Alfred Vivian acted as toastmaster.

Hearlded as the beginning of a great industry, ten thousand tons of potash made from dried kelp or seaweed, at prices not exceeding those of the German potash salts, were recently unloaded in the port of New York. The potash in the kelp is said to be readily available and the kelp in addition supplies humus which is free from weed seeds.

The only important available supply of potash for fertilizer in the form of muriate, sulphate or kaint, has been from Germany. The discovery that certain seaweeds growing in American waters were rich in valuable fertilizers has aroused great interest among American farmers. The giant bladder-kelp of the Pacific Coast is the most important of the seaweeds and contains the largest percentage of potash, the dried prepared kelp analyzing about 20 per cent potash.

The difficulty of harvesting kelp was one of the greatest drawbacks to its extensive use as a fertilizer but kelp harvesting machines have now been perfected. The opening of the Panama Canal with consequent low freight rates, enabled the manufacturers to ship to New York at a profit.

Advanced students in the courses in pomology made an inspection trip the second week in May through the southern part of the state. The party spent some time in Rome Township, Lawrence County, the original home of the Rome Beauty apple, and one of the largest orchard sections in the state. From this section the party went to Gallipolis, Point Pleasant, and Marietta, visiting the large orchards in Washington County. It is in this county that the experiment station has conducted extensive fertilizer experiments. The party was met here by students in vegetable gardening and an inspection made of the truck growing farms for which Marietta is noted.

Appropriation for two new buildings to meet the needs of the Ohio State University and for additional tracts of farm land for the department of agriculture was voted through the Finance Committee of the legislature, April 14.

A domestic science building to cost \$150,000 and a shop building for manual training to cost \$120,000 are provided. Ninety acres of land will be purchased west of the Olentangy River at a probable cost of \$70,000.

The domestic science building, plans for which have been completed by Prof. J. N. Bradford, University Architect, will be three storied; and the domestic science departments of other universities, to whom the plans have been submitted, have pronounced it more complete and up-to-date than any other similar building now in use in the United States. One of the features of the new building will be a model flat, consisting of dining-room, living-room, study-room, kitchen, two bed-rooms and a laundry.

Plans for the shop building are not completed, but it will be strictly of the factory type, skeleton in construction, with walls of glass.

Clark S. Wheeler, supervisor of extension schools, and N. E. Shaw left April 17 for San Francisco where they will arrange the exhibit prepared to represent Ohio agriculturally at the Panama-Pacific Exposition. Prof. C. S. Plumb helped to arrange the wool exhibit before it was sent. J. E. McClintock, extension editor, prepared a booklet concerning many of the features in which Ohio is prominent, which will be distributed during the exposition.

Fertilizers and farm demonstration meetings will begin May 15. These will be conducted after the same plan as last year, a demonstrator being sent into communities desiring demonstrations giving several lectures. This work will require the services of three or four instructors during the summer and fall months.

As a result of the bad scourge of blight the last few years but few pear trees are left in the university orchard. Practically all varieties have been equally affected; the Kieffer and Seckel are the only ones which have not had whole trees blighted. The blight of blossoms has been especially bad this year. The department plans to replace these trees shortly with peach and plum trees.

County agriculturists of Ohio have been co-operating with the agricultural extension department in conducting pruning and spraying demonstrations in their respective counties. Because of their assistance a great deal more could be accomplished as the men on the home ground could arrange schedules and select the most important points for the demonstrations.

Students in Vegetable gardening recently made the annual trip to the large greenhouses at Newark. These greenhouses are among the largest in the state and are well equipped from every standpoint. Not only are the greenhouses of interest, but the grounds surrounding the houses have been landscaped by Mr. Weyant, the owner, making them very attractive. Additional greenhouses are now being built which will make the total space under glass about ten acres.

Some crop survey work has been undertaken by the agricultural extension department for the first time this spring. Wheat was the first crop selected and the men doing this work have visited various points in the state where it was thought the most comprehensive factors as to the cause of high and low yields of wheat could be studied and reported. W. E. Hanger, Earl Chenault, F. H. Herzer, S. E.

Dolle and M. F. Abel are the men who have been working on the survey.

Maxwalton Pride II, a Shorthorn bull calf, has recently been purchased by the department of animal husbandry from Carpenter and Ross of Mansfield, Ohio, to be placed at the head of the university Shorthorn herd. This calf is by Maxwalton Renown by Avondale, and out of a cow belonging to the Rosewood family. He is a half brother to the present head of the herds owned by E. S. Kelly of Yellow Springs and W. C. Rosenberger of Tiffin. Carpenter and Ross took many important winnings on the fair circuit with this calf last season.

Three new greenhouses have just been completed, each 15 by 133 feet. These houses will be planted to tomatoes and muskmelons for the rest of the spring. However, no heat will be applied, the early and proper maturity of the crop being dependent upon the ability to maintain a uniform temperature by means of ventilation. In addition to these houses a large workroom is being built through the center of the whole plan of the houses which will be used by students in laboratory work. On the other side of this workroom there will be a plant house and a propagating house each 8 by 79 feet. In the front of the workroom a conservatory is being erected 24 by 26 feet. Visitors to the greenhouses will enter through this conservatory. There will also be two longer, and narrow conservatory houses joining the entire plan of houses. In the basement of the workroom there will be two large compartments, one of which will be used as a forcing house for rhubarb, asparagus, and mushrooms; and the other will be a storage for bulbs and flowering plants.

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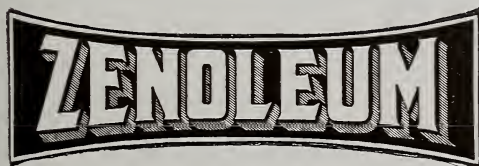
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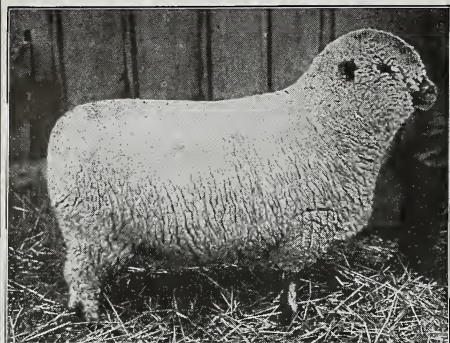
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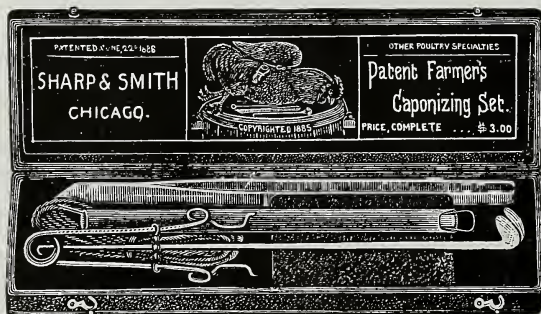
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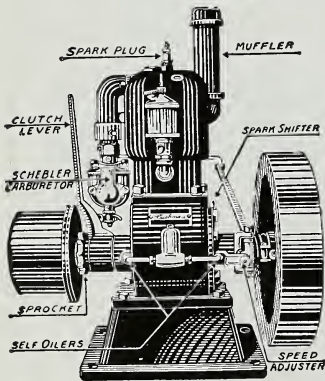
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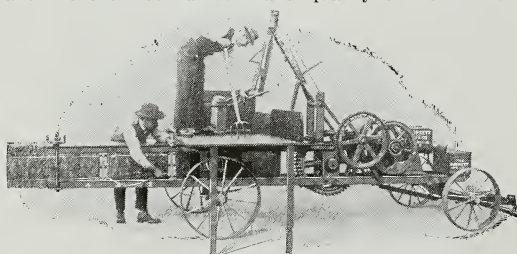
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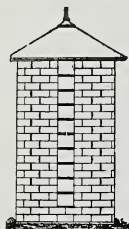
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Will Solve Your Hog Cholera Troubles and Save Your "Bacon"

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New Hampshire, Ohio, Jan. 18, 1915.

The Thiele Laboratories Co.,
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The average loss in this number of hogs has been about 10%. And could this number of hogs have had proper care and feeding after treatment, the loss would be still less. The only places where loss of hogs occurred was where hogs were fed corn and hard food stuff too soon after sickness.

I believe, with proper care and feeding, that almost every hog could be saved.

If the stock raiser would give his sick hogs the same care that he gives his sick horse, or sick cow, we could give him far better results. "544" will not do it all, the hog must have some care along with the treatment.

Yours respectfully,
DR. ARTHUR McCORMICK.

This report is only one of many. It will be to your advantage to investigate the merits of our treatment.

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